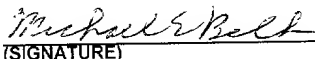


| FORM PTO-1390 U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE | | ATTORNEY'S DOCKET NO. PHN 17,554 | | | | | | | | | | |
|--|--|---|--------------------------------|--|--------------------------------|--------------------|-----------------|-----------------------|---|--|---------------------------|---------------------------------|
| TRANSMITTAL LETTER TO THE UNITED STATES DESIGNED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371 | | U.S. Application No. (if known, see 37 C.F.R. 1.5) 09/1787095 | | | | | | | | | | |
| INTERNATIONAL APPLICATION NO. PCT/EP00/06548 | INTERNATIONAL FILING DATE JULY 10, 2000 | PRIORITY DATE CLAIMED JULY 15, 1999 | | | | | | | | | | |
| TITLE OF INVENTION LASER DIODE CONTROL IN REWRITABLE OPTICAL RECORDING DEVICES | | | | | | | | | | | | |
| APPLICANT(S) FOR DO/EO/US GIJSBERT JOSEPH VAN DEN ENDEN | | | | | | | | | | | | |
| Applicant(s) herewith submit to the United States Designated/Elected Office (DO/EO/US) the following items and other information: | | | | | | | | | | | | |
| <p>1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.</p> <p>2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.</p> <p>3. <input type="checkbox"/> This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).</p> <p>4. <input type="checkbox"/> A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.</p> <p>5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371 (c)(2))</p> <p>a. <input checked="" type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau).</p> <p>b. <input type="checkbox"/> has been transmitted by the International Bureau.</p> <p>c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US).</p> <p>6. <input type="checkbox"/> A translation of the International Application into English (35 U.S.C. 371(c)(2))</p> <p>7. <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))</p> <p>a. <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau).</p> <p>b. <input type="checkbox"/> have been transmitted by the International Bureau.</p> <p>c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired.</p> <p>d. <input checked="" type="checkbox"/> have not been made and will not be made.</p> <p>8. <input type="checkbox"/> A translation of the amendment to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).</p> <p>9. <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).</p> <p>10. <input type="checkbox"/> A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).</p> <p>Items 11. to 16. below concern document(s) or information included:</p> <p>11. <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 C.F.R. 1.97 and 1.98.</p> <p>12. <input checked="" type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 C.F.R. 3.28 and 3.31 is included.</p> <p>13. <input type="checkbox"/> A FIRST preliminary amendment.</p> <p><input type="checkbox"/> A SECOND OR SUBSEQUENT preliminary amendment.</p> <p>14. <input type="checkbox"/> A substitute specification.</p> <p>15. <input checked="" type="checkbox"/> A change of power of attorney and/or address letter.</p> <p>16. <input checked="" type="checkbox"/> Other items or information:</p> <p>a) AUTHORIZATION PURSUANT TO 37 CFR 1.136(a)(3)</p> <p>b) ONE (1) SHEET OF FORMAL DRAWING</p> <p>c) APPLICATION AS PUBLISHED (WO 01/06499)</p> | | | | | | | | | | | | |
| <table border="1"> <tr> <th colspan="2">CERTIFICATE OF EXPRESS MAILING</th> </tr> <tr> <td>Express Mail Mailing Label No.</td> <td><u>EL686948626</u></td> </tr> <tr> <td>Date of Deposit</td> <td><u>MARCH 13, 2001</u></td> </tr> <tr> <td colspan="2">I hereby certify that this paper and/or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. 1.10 on the date indicated above and is addressed to the Commissioner of Patents and Trademarks, Washington D.C. 20231</td> </tr> <tr> <td>Noemi Chapa Typed Name</td> <td><u>Noemi Chapa</u> Signature</td> </tr> </table> | | | CERTIFICATE OF EXPRESS MAILING | | Express Mail Mailing Label No. | <u>EL686948626</u> | Date of Deposit | <u>MARCH 13, 2001</u> | I hereby certify that this paper and/or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. 1.10 on the date indicated above and is addressed to the Commissioner of Patents and Trademarks, Washington D.C. 20231 | | Noemi Chapa Typed Name | <u>Noemi Chapa</u> Signature |
| CERTIFICATE OF EXPRESS MAILING | | | | | | | | | | | | |
| Express Mail Mailing Label No. | <u>EL686948626</u> | | | | | | | | | | | |
| Date of Deposit | <u>MARCH 13, 2001</u> | | | | | | | | | | | |
| I hereby certify that this paper and/or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. 1.10 on the date indicated above and is addressed to the Commissioner of Patents and Trademarks, Washington D.C. 20231 | | | | | | | | | | | | |
| Noemi Chapa Typed Name | <u>Noemi Chapa</u> Signature | | | | | | | | | | | |

| | | | | | |
|--|--------------|---|------------|--|----|
| U.S. APPLICATION NO. (If known, see 37 C.F.R. 1.5) 097787095 | | INTERNATIONAL APPLICATION NO. PCT/EP00/06548 | | ATTORNEY'S DOCKET NUMBER PHN 17,554 | |
| 17 [X] The following fees are submitted: | | | | CALCULATIONS (PTO USE ONLY) | |
| BASIC NATIONAL FEE (37 C.F.R. 1.492(A)(1)-(5)): | | | | | |
| Search Report has been prepared by the EPO or JPO | | \$940.00 | | | |
| International preliminary-examination fee paid to USPTO (37 C.F.R. 1.482) | | \$720.00 | | | |
| No international preliminary examination fee paid to USPTO (37 C.F.R. 1.482) but international search fee paid to USPTO (37 C.F.R. 1.445(a)(2)) | | \$760.00 | | | |
| Neither international preliminary examination fee (37 C.F.R. 1.482) nor international search fee (37 C.F.R. 1.445(a)(2)) paid to USPTO | | \$970.00 | | | |
| International preliminary examination fee paid to USPTO (37 C.F.R. 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4) | | \$ 96.00 | | | |
| ENTER APPROPRIATE BASIC FEE AMOUNT = | | | | \$970.00 | |
| Surcharge of \$130.00 for furnishing the oath or declaration later than [] 20 [] 30 months from the earliest claimed priority date (37 C.F.R. 1.492(e)). | | | | \$ | |
| CLAIMS | NUMBER FILED | NUMBER EXTRA | RATE | | |
| Total Claims | 2 - 20 = | | X \$ 18.00 | \$ | |
| Independent claims | 1 - 3 = | | X \$ 78.00 | \$ | |
| MULTIPLE DEPENDENT CLAIMS (if applicable) | | | + \$260.00 | \$ | |
| TOTAL OF ABOVE CALCULATIONS = | | | | \$970.00 | |
| Reductions by 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 C.F.R. 1.9, 1.27, 1.28) | | | | \$ | |
| SUBTOTAL = | | | | \$970.00 | |
| Processing fee of \$130.00 for furnishing the English translation later than [] 20 [] 30 months from the earliest claimed priority date (37 C.F.R. 1.492(f)). | | | | \$ | |
| TOTAL NATIONAL FEE = | | | | \$ | |
| Fee for recording the enclosed assignment (37 C.F.R. 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 C.F.R. 3.28, 3.31). \$40.00 per property + | | | | \$40.00 | |
| TOTAL FEES ENCLOSED = | | | | \$1,010.00 | |
| | | | | Amount to be refunded | \$ |
| | | | | charged | \$ |
| <p>a. [] A check in the amount \$_____ to cover the above fees is enclosed.</p> <p>b. [X] Please charge my Deposit Account No. <u>14-1270</u> in the amount of <u>\$1,010.00</u> to cover the above fees. A duplicate copy of this sheet is enclosed.</p> <p>c. [X] The Commissioner is hereby authorized to charge any additional fee, with the exception of the Base Issue Fee, which may be required, or credit any overpayment to Deposit Account No. 14-1270. A duplicate copy of this sheet is enclosed.</p> <p>NOTE: Where an appropriate time limit under 37 C.F.R. 1.494 or 1.495 has not been met, a petition to revive (37 C.F.R. 1.137(a) or (b)) must be filed and granted to restore the application to pending status.</p> <p>SEND ALL CORRESPONDENCE TO:</p> <p>Corporate Patent Counsel Philips Electronics North America Corporation 580 White Plains Road Tarrytown, NY 10591</p> <p>DATE OF MAILING: March 13, 2001</p> <p style="text-align: right;">  (SIGNATURE) Michael E. Belk NAME <u>33,357</u> (REGISTRATION NUMBER) </p> | | | | | |

Laser diode controller in rewritable optical recording devices

The invention relates to an optical recording device for recording on rewritable media with which two different states depending on the information content are generated on the medium.

For writing optical media, for example, laser diodes are used to heat up the medium spot by spot. When a material layer of the optical medium is heated beyond its melting point, the material of this layer may be melted spot by spot. Without further supply of energy the information carrier material cools down fast and changes from the molten state to an amorphous state. With dosed energy supply, which keeps the information carrier material below the melting temperature for a certain period of time, but above the crystallization temperature inherent in this material, the information carrier material changes to a crystalline state. Since the reflection properties of the information carrier layer in the crystalline and in the amorphous state are widely different, the stored data may again be read by evaluation of the amount of reflected light.

Since during the writing operation the phase condition of the information carrier layer is determined by the energy applied to a certain area within a certain period of time, the control of the power produced by a laser diode as such is not sufficient, because soiling such as, for example, finger prints and dust particles on the surface of the optical storage medium, absorbs the energy applied to the material. If the energy applied by the laser diode is too small as a result of the soiling, the information carrier layer at this spot may go over to an amorphous state instead of a crystalline state, which is contrary to the projected effect. If the energy for the compensation for such soiling is selected to be higher, the energy applied at spots without soiling may become so high that the information carrier material changes over to a crystalline state undesirably. This would lead to the fact that the written information does not correspond to the information one would have liked to write.

For controlling the writing operation the written state is read preferably during the writing operation, to recognize disturbances of the writing operation and to compensate for them.

An optical recording device in which the amount of light used for the writing is controlled by changes in the reflected light is known, for example, from JP 5-292672. The

reflected light is buffered by means of the sample-and-hold circuit and compared to a reference value. The difference between measured value and reference value is used for controlling the amount of light radiated by the laser diode used for the writing.

It is an object of the invention to provide the control of the output power of the laser diode used for writing, so that it is also suitable for rewritable media.

This object is achieved in that during the writing of the states the reflection is measured of only one of the states and the measured value is used for controlling the power of the laser diode even when the other state is written.

Preferably, when a highly reflecting (= crystalline) state is written, the reflected amount of light is measured by means of a signal peak detector and compared to a reference value. In case of deviations, for example, as a result of soiling of the surface of the storage medium, the power of the laser diode is readjusted accordingly. The readjustment factor determined in this manner is also retained for writing a low-reflection (= amorphous) state. The invention here assumes that the soilings affecting the writing operation cover a large surface. An individual readjustment for writing during a low-reflecting state is not necessary as a result. A channel coding ensures that each state repeats itself only a limited number of times anyhow. In this manner it is ensured that the highly reflecting states are not too far apart and the distances between highly reflecting states to be written are generally smaller than the extent of the soilings.

Preferably, the reflection is measured at the spots where a piece already in the highly reflecting state is overwritten with a highly reflecting state.

The invention will now be further described and explained on the basis of examples of embodiment shown in the sole Figure.

The example of embodiment shows an optical recording device comprising a control circuit 1 according to the invention for controlling the writing operation of a laser diode 2 on an optical medium 3. The optical medium 3, for example, a CD-RW, is driven by a motor 4 shown diagrammatically. In a control circuit 5 is determined the respective laser power of the laser diode 2 necessary for achieving a certain write strategy and is predefined as a target value P_x of the control circuit 1. By means of a photodiode (not shown) the storage medium is read out at the same position where it is written. The reading signal is applied to a peak value detector 6 and generates a reading signal M . This reading signal is compared to a reference signal M_{ref} and the difference signal is applied to an input of a multiplying stage 11 via a control network 13. The time-dependent control behavior of the control circuit 1 is determined by the control network 13.

Another input of the multiplying stage 11 is supplied with the nominal power P_x . The output of the multiplying stage 11 is applied to a first input of a summing circuit 12. To set the point of operation of the laser diode, the other input of the summing stage 12 is supplied with an offset voltage. When the amount of reflected light changes, the gain factor of the control circuit is adjusted accordingly so as to provide as constant a power as possible on the storage medium 3 when one or the other state is written.

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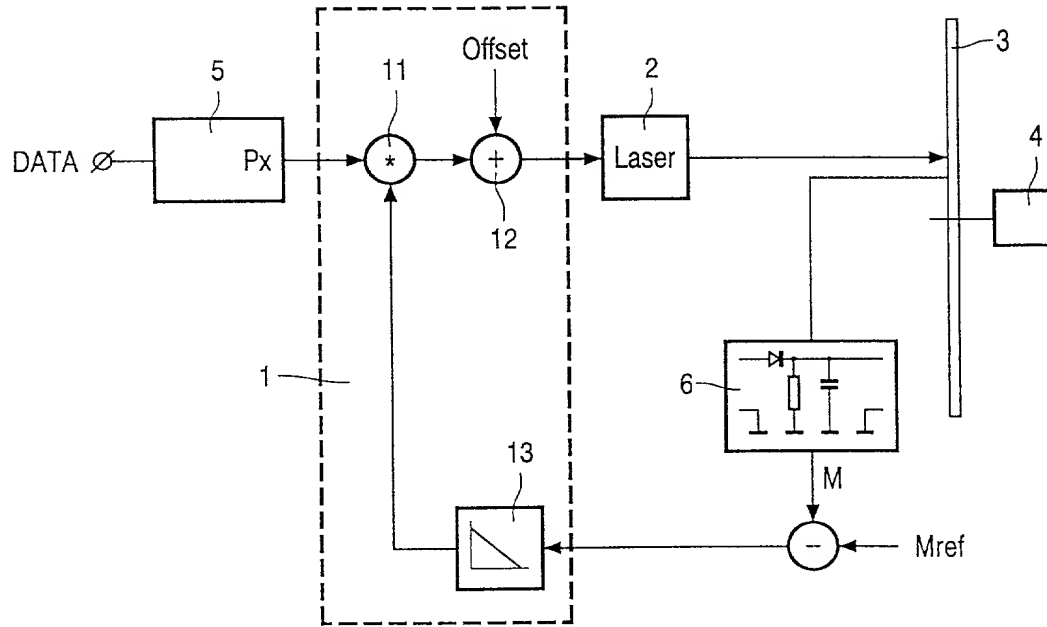
1. An electronic optical recording device for optical recording on rewritable media, with which two different states depending on the information content are generated on the media, characterized

2. An electronic device as claimed in claim 1,
characterized
in that the reflection is measured at the spots where a piece already in the highly reflecting
state is overwritten with a highly reflecting state.

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Fig. 1

1/1



COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY
(includes Reference to PCT International Applications)

ATTORNEY'S DOCKET
NUMBER
PHN 17.554 US

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: **"Laser diode control in rewritable optical recording devices"**
the specification of which (check only one item below):

☐ is attached hereto.

☐ was filed as United States application

Serial No _____

on _____

and was amended

on _____

☒ was filed as PCT international application

Number PCT/EP00/06548

on 10 July 2000

and was amended under PCT Article 19

on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, § 1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. 119:

| COUNTRY | APPLICATION NUMBER | DATE OF FILING DAY, MONTH, YEAR | PRIORITY CLAIMED UNDER 35 USC 119 |
|---------|--------------------|------------------------------------|---|
| Germany | 19932658.4 | 15 July 1999 | YES |
| | | | |
| | | | |
| | | | |

U.S. DEPARTMENT OF COMMERCE -Patent and Trademarks Office
(July 1994)

| | | | |
|--|--|--|--|
| Combined Declaration For Patent Application and Power of Attorney (Continued) (includes Reference to PCT International Applications) | | Attorneys Docket Number PHN 17.554 US | |
| POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (List name and registration number) | | | |
| Algy Tamoshunas Reg. No. <u>27,677</u> Jack E. Haken, Reg. No. 26,902 | | Direct Telephone Calls to: (name and telephone number) (914)332-0222 | |

| | | | | |
|-----|-------------------------|---|--|--|
| 201 | FULL NAME OF INVENTOR | FAMILY NAME VAN DEN ENDEN | FIRST GIVEN NAME Gijsbert | SECOND GIVEN NAME Joseph |
| | RESIDENCE & CITIZENSHIP | CITY Veldhoven | STATE OR FOREIGN COUNTRY The Netherlands | COUNTRY OF CITIZENSHIP The Netherlands |
| | POST OFFICE ADDRESS | POST OFFICE ADDRESS Burcht 86 | CITY 5509 NP Veldhoven | STATE & ZIP CODE/COUNTRY The Netherlands |
| 202 | FULL NAME OF INVENTOR | FAMILY NAME | FIRST GIVEN NAME | SECOND GIVEN NAME |
| | RESIDENCE & CITIZENSHIP | CITY | STATE OR FOREIGN COUNTRY | COUNTRY OF CITIZENSHIP |
| | POST OFFICE ADDRESS | POST OFFICE ADDRESS | CITY | STATE & ZIP CODE/COUNTRY |
| 203 | FULL NAME OF INVENTOR | FAMILY NAME | FIRST GIVEN NAME | SECOND GIVEN NAME |
| | RESIDENCE & CITIZENSHIP | CITY | STATE OR FOREIGN COUNTRY | COUNTRY OF CITIZENSHIP |
| | POST OFFICE ADDRESS | POST OFFICE ADDRESS | CITY | STATE & ZIP CODE/COUNTRY |
| 204 | FULL NAME OF INVENTOR | FAMILY NAME | FIRST GIVEN NAME | SECOND GIVEN NAME |
| | RESIDENCE & CITIZENSHIP | CITY | STATE OR FOREIGN COUNTRY | COUNTRY OF CITIZENSHIP |
| | POST OFFICE ADDRESS | POST OFFICE ADDRESS | CITY | STATE & ZIP CODE/COUNTRY |
| 205 | FULL NAME OF INVENTOR | FAMILY NAME | FIRST GIVEN NAME | SECOND GIVEN NAME |
| | RESIDENCE & CITIZENSHIP | CITY | STATE OR FOREIGN COUNTRY | COUNTRY OF CITIZENSHIP |
| | POST OFFICE ADDRESS | POST OFFICE ADDRESS | CITY | STATE & ZIP CODE/COUNTRY |

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

| | | |
|---|---------------------------|---------------------------|
| SIGNATURE OF INVENTOR 201 CITY <div style="font-family: cursive; font-size: 1.2em; margin-top: 10px;">G.v.d. Eenden</div> | SIGNATURE OF INVENTOR 202 | SIGNATURE OF INVENTOR 203 |
| DATE <u>8th February 2001</u> | DATE | DATE |
| SIGNATURE OF INVENTOR 204 | SIGNATURE OF INVENTOR 205 | |
| DATE | DATE | |

U.S. DEPARTMENT OF COMMERCE- Patent and Trademarks Office

(July 1994)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Atty. Docket

GIJSBERT JOSEPH VAN DEN ENDEN

PHN 17,554

Filed: CONCURRENTLY

Title: LASER DIODE CONTROL IN REWRITABLE OPTICAL RECORDING DEVICES

Commissioner for Patents, Washington, D.C. 20231

APPOINTMENT OF ASSOCIATES

Sir:

The undersigned Attorney of Record hereby revokes all prior appointments (if any) of Associate Attorney(s) or Agent(s) in the above-captioned case and appoints:

MICHAEL E. BELK

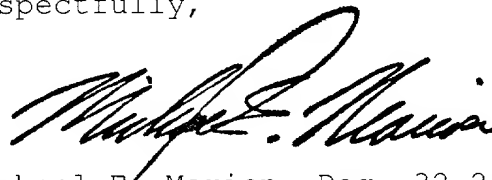
(Registration No. 33,357)

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c/o U.S. PHILIPS CORPORATION, Intellectual Property Department, 580, White Plains Road, Tarrytown, New York 10591, his Associate Attorney(s)/Agent(s) with all the usual powers to prosecute the above-identified application and any division or continuation thereof, to make alterations and amendments therein, and to transact all business in the Patent and Trademark Office connected therewith.

ALL CORRESPONDENCE CONCERNING THIS APPLICATION AND THE LETTERS PATENT WHEN GRANTED SHOULD BE ADDRESSED TO THE UNDERSIGNED ATTORNEY OF RECORD.

Respectfully,



Michael E. Marion, Reg. 32,266
Attorney of Record

Dated at Tarrytown, New York

RECEIVED "03100" 03/04/01